

CLAIM AMENDMENTS

- 1    1. (Currently Amended) An apparatus for routing or switching data packets, including
  - 2    a router; and
  - 3    an expanded M-trie data structure, said data structure organized as a multi-level tree having
    - 4       a set of nodes, including a root node, inferior nodes and terminal nodes, wherein
    - 5       each node includes an address and an opcode.
- 1    2. (Previously Presented) An apparatus as in claim 1, wherein said data structure facilitates
  - 2       a lookup based on data included in a data packet.
- 1    3. (Previously Presented) An apparatus as in claim 1, wherein said data structure facilitates
  - 2       a lookup of data included in a packet header.
- 1    4. (Previously Presented) An apparatus as in claim 1, wherein said data structure facilitates
  - 2       a lookup of data included in an Internet Protocol packet header.
- 1    5. (Previously Presented) An apparatus as in claim 1, wherein said opcode describes an
  - 2       operation to be performed based upon data included in a packet header so as to facilitate
  - 3       lookup of said packet header.
- 1    6. (Previously Presented) An apparatus as in claim 1, wherein said address includes the
  - 2       address of a node in said expanded M-trie data structure that is to be traversed.

1    7. (Original) An apparatus as in claim 1, wherein said expanded M-trie data structure  
2    includes a set of access control parameters.

1    8. (Previously Presented) An apparatus as in claim 1, wherein said expanded M-trie data  
2    structure includes a set of Quality of Service (QoS) parameters.

1    9. (Previously Presented) An apparatus as in claim 1, wherein said expanded M-trie data  
2    structure includes a set of Class of Service (CoS) parameters.

1    10. (Previously Presented) An apparatus as in claim 1, wherein said nodes include opcodes  
2    for demultiplexing, opcodes for matching, and opcodes for hashing.

1    11. (Previously Presented) An apparatus as in claim 10, wherein said opcodes for  
2    demultiplexing include instructions to demultiplex into branches of said expanded M-trie  
3    data structure based on contents of one or more bytes included in a data packet.

1    12. (Previously Presented) An apparatus as in claim 10, wherein said opcodes for  
2    demultiplexing include instructions to demultiplex into branches of said expanded M-trie  
3    data structure based on contents of one or more bytes included in a packet header that is  
4    being read.

1    13. (Previously Presented) An apparatus as in claim 10, wherein said opcodes for  
2    demultiplexing include instructions to demultiplex into branches of said expanded M-trie

3 data structure based on contents of one or more bytes included in an Internet Protocol packet  
4 header that is being read.

1 14. (Previously Presented) An apparatus as in claim 10, wherein said opcodes for matching  
2 include instructions to compare contents of a byte in the flow label to given node data.

1 15. (Previously Presented) An apparatus as in claim 10, wherein said opcodes for hashing  
2 include instructions to hash into different branches of the expanded M-trie data structure  
3 based on contents of a byte in said packet header.

1 16. (Currently Amended) A method for routing or switching data packets, including the  
2 steps of:  
3 receiving a data packet at an input interface on a router or switch;  
4 looking up information in the header of said data packet in an expanded M-trie data  
5 structure, wherein said expanded M-trie data structure is organized as a multi-level  
6 tree including a root node, inferior nodes, and terminal nodes, wherein each node  
7 includes an address and an opcode;  
8 terminating said lookup; and  
9 routing said data packet at one or more output interfaces on said router or said switch.

1 17. (Canceled)

1    18. (Currently Amended) A method as in claim 1716, wherein said opcode describes an  
2    operation to be performed that is based upon data included in a packet header, so as to  
3    facilitate a lookup of said packet header.

1    19. (Currently Amended) A method as in claim 1716, wherein said address includes the  
2    address of a node in said expanded M-trie data structure that is to be traversed.

1    20. (Original) A method as in claim 16, wherein said expanded M-trie data structure  
2    includes a set of access control parameters.

1    21. (Previously Presented) A method as in claim 16, wherein said expanded M-trie data  
2    structure includes a set of Quality of Service (QoS) parameters.

1    22. (Previously Presented) A method as in claim 16, wherein said expanded M-trie data  
2    structure includes a set of Class of Service (CoS) parameters.

1    23. (Currently Amended) A method as in claim 1716, wherein said nodes include opcodes  
2    for demultiplexing, opcodes for matching, and opcodes for hashing.

1    24. (Previously Presented) A method as in claim 23, wherein said opcodes for  
2    demultiplexing include instructions to demultiplex into branches of said expanded M-trie  
3    data structure based on contents of a byte of said packet header that is being read.

1    25. (Previously Presented) A method as in claim 23, wherein said opcodes for matching  
2    include instructions to compare the contents of a given byte of the flow label to given node  
3    data.

1    26. (Currently Amended) A method as in claim 23, wherein said opcodes for hashing  
2    include instructions to hash into different M-trie plus branches based on the contents of a  
3    given [[4]] byte in said packet header.

1    27. (Canceled)

1    28. (Currently Amended) An apparatus for routing or switching data packets, comprising a  
2    device that performs a method comprising:  
3    storing in memory an M-trie data structure, said data structure organized as a multi-level tree  
4    having a set of nodes, including a root node, inferior nodes and terminal nodes,  
5    wherein each node includes an address and an opcode;  
6    receiving a data packet at an input interface on a router or switch, wherein the data packet  
7    includes information in ~~an M-trie data structure having~~ at least a header with at least  
8    ~~an entity a field that is used by said M-trie data structure to indicate[[s]] an action for~~  
9    ~~the router said device to perform in order~~ to select a leaf associated with said M-trie  
10    data structure;  
11    looking up the information, wherein the looking up includes performing the action; and  
12    routing said data packet at one or more output interfaces on said router or said switch.

1    29. (Currently Amended) A method for routing or switching data packets, comprising:

2    storing in memory an M-trie data structure, said data structure organized as a multi-level tree  
3        having a set of nodes, including a root node, inferior nodes and terminal nodes,  
4        wherein each node includes an address and an opcode;  
5    receiving a data packet at an input interface on a router or switch, wherein the data packet  
6        includes information in ~~an M-trie data structure having~~ at least a header with at least  
7        ~~an entity a field that is used by said M-trie data structure to indicate[[s]]~~ an action for  
8        ~~the a router to perform in order~~ to select a leaf associated with said M-trie data  
9        structure;  
10      looking up the information, wherein the looking up includes performing the action; and  
11      routing said data packet at one or more output interfaces on said router or said switch.

1    30. (Currently Amended) A memory storing a program for performing a method for routing  
2    or switching data packets, comprising:  
3        storing in memory an M-trie data structure, said data structure organized as a multi-level tree  
4        having a set of nodes, including a root node, inferior nodes and terminal nodes,  
5        wherein each node includes an address and an opcode;  
6    receiving a data packet at an input interface on a router or switch, wherein the data packet  
7        includes information in ~~an M-trie data structure having~~ at least a header with at least  
8        ~~an entity a field that is used by said M-trie data structure to indicate[[s]]~~ an action for  
9        ~~the a router to perform in order~~ to select a leaf associated with said M-trie data  
10        structure;  
11      looking up the information, wherein the looking up includes performing the action; and  
12      routing said data packet at one or more output interfaces on said router or said switch.

1 31. (Canceled)

1 32. (Currently Amended) A memory as in claim 3130, wherein said address includes an  
2 address of a node in said M-trie data structure that is to be traversed.

1 33. (Previously Presented) A memory as in claim 30, wherein said M-trie data structure  
2 includes a set of access control parameters.

1 34. (Previously Presented) A memory as in claim 30, wherein said M-trie data structure  
2 includes a set of Quality of Service (QoS) parameters.

1 35. (Previously Presented) A memory as in claim 30, wherein said expanded M-trie data  
2 structure includes a set of Class of Service (CoS) parameters.

1 36. (Currently Amended) A memory as in claim 3130 wherein at least one of the root node,  
2 inferior nodes, or the terminal node includes an opcode for demultiplexing, an opcode for  
3 matching, and an opcode for hashing.

1 37. (Previously Presented) A memory as in claim 36 wherein said opcode for  
2 demultiplexing includes instructions to demultiplex into branches of the M-trie data  
3 structure based on contents of a byte of said packet header.

1 38. (Previously Presented) A method as in claim 36, wherein said opcode for matching  
2 includes instructions to compare the contents of a given byte of a flow label to given node  
3 data.

- 1    39. (Previously Presented) A method as in claim 36, wherein said opcode for hashing
- 2    includes instructions to hash into different branches the M-trie data structure based on the
- 3    contents of a given set of bytes in said packet header.